

## **Abstract**

The invention provides methods for integrating a heterologous polynucleotide into the genome of an avian cell. The methods deliver to an avian cell a polynucleotide and a source of integrase activity that mediates recombination between  
5 the polynucleotide and the genomic DNA of the avian cell. The invention provides modified avian or artificial chromosomes as vectors to shuttle transgenes or gene clusters into an avian genome. Another aspect of the invention are avian cells genetically modified with a transgene vector. One cell line for the delivery and integration of a transgene comprises a heterologous attP site and, optionally, a region  
10 for expressing the integrase. Methods are also included for the production of a heterologous polypeptide by transgenic avian tissue involve integrating a heterologous polynucleotide into the avian genome. The present invention also relates to methods of producing transgenic chickens which include introducing into an avian cell a nucleic acid comprising a transgene and an integrase activity in addition to a cationic  
15 polymer and/or a nuclear localization signal and introducing the avian cell into a recipient avian wherein the recipient avian produces an offspring which includes the transgene. Also included are methods of dispersing a nucleic acid in a cell.